

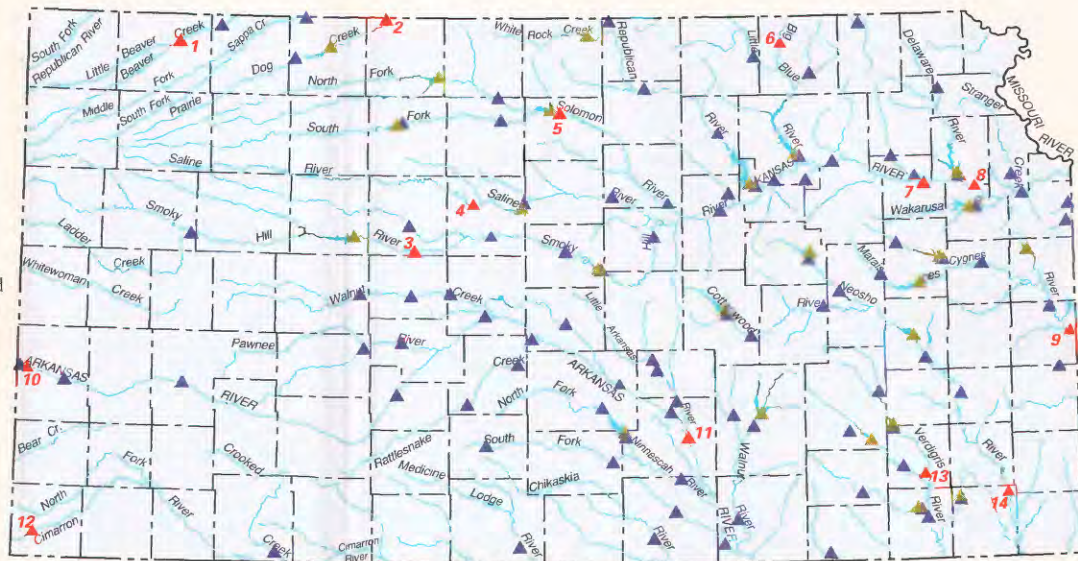
Water Data on the INTERNET

A photograph of a river scene. On the left bank, there is a large, multi-story building with a reddish-brown facade. On the right bank, there is a smaller building. Several people are standing on the riverbank, and a small boat is visible in the water. The image is somewhat faded and has a vintage feel.

Fishing on the Kansas River below Bowersock Dam in Lawrence, Kansas.

These locations have near real-time stream and lake information available.

- ▶ **Gaging station**—An example of real-time information for these stations is shown in table below. Number is map number used in table below
- ▶ **Gaging station**—Real-time information also available from these stations but not shown in table below
- ▶ **Lake gaging station**—Lake elevation and inflow and outflow real-time information available for twenty-four lakes and reservoirs operated by the USGS and the U.S. Army Corps of Engineers, Tulsa District



Example of near real-time data available on the INTERNET for selected stations in Kansas.

Map Number	Station Number	Station Name	Long-term median flow 08/19	Min Flow	Flood Stage	Most Current Water				Funding	EXPLANATION
						Flow	Stage	Date	Time		
1	06846000	BEAVER CREEK AT LUDELL	1.0	--	11	00	3.01	08/19	07:00	■ ■	Source of funding by cooperative agency <div>■ Kansas Water Office (Funds from Kansas Water Plan)</div> <div>■ U.S. Army Corps of Engineers, Kansas City District</div> <div>■ U.S. Army Corps of Engineers, Tulsa District</div> <div>■ City of Wichita</div> <div>■ Arkansas River Compact Administration</div> <div>■ Kansas State Department of Agriculture, Division of Water Resources</div> <div>■ City of Hays</div> <div>■ U.S. Geological Survey</div>
2	06848500	PRAIRIE DOG CREEK NEAR WOODRUFF	1.8	--	18	20	4.15	08/19	04:00	■ ■	
3	06862850	SMOKY HILL R BELOW SCHENCHEN	0	--	10	47	3.52	08/19	04:45	■ ■	
4	06867000	SALINE RIVER NEAR RUSSELL	23	2	18	70	4.72	08/19	04:00	■ ■ ■ ■	
5	06875900	SOLOMON RIVER NEAR GLEN ELDER	75	--	21	50	7.91	08/19	04:30	■ ■	
6	06882510	BIG BLUE RIVER AT MARYSVILLE	543	90	35	633	13.21	08/19	05:30	■	
7	06889000	KANSAS RIVER AT TOPEKA	3280	--	26	2530	6.41	08/19	07:45	■	
8	06891000	KANSAS RIVER AT LECOMPTON	3500	--	17	2700	3.19	08/19	07:00	■ ■	
9	06916600	MARIAS DES CYGNES R NR KS-MO LINE	125	--	25	910	3.17	08/19	05:30	■ ■ ■ ■	
10	07137500	ARKANSAS RIVER NEAR COOLIDGE	138	--	8	735	4.48	08/19	06:00	■ ■	
11	07143375	ARKANSAS RIVER NEAR MAIZE	135	--	12	858	7.37	08/19	04:00	■ ■	
12	07155590	CIMARRON RIVER NEAR ELKHART	0	--	11	82	3.28	08/19	07:15	■ ■	
13	07166500	VERDIGRIS RIVER NEAR ALTOONA	41	--	23	128	3.05	08/19	05:15	■ ■	
14	07183500	NEOSHO RIVER NEAR PARSONS	265	50	21	1720	8.96	08/19	05:00	■ ■ ■ ■	

Streamflow—In cubic feet per second

Stage—Height of water surface above gage datum, a reference elevation, in feet

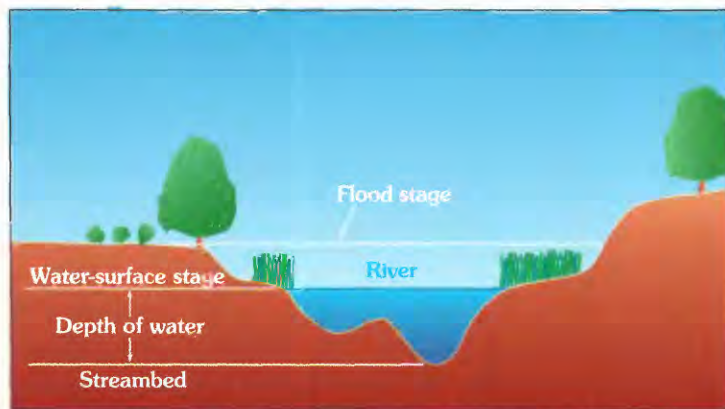
Min flow—In cubic feet per second. Minimum desirable streamflow provided by the Kansas Water Office

Flood stage—Level where stream begins to overflow its banks (from National Weather Service), in feet

Datum—Datum for each gaging station is shown on "complete station data" page. When datum is added to stage, the result is water surface elevation above mean sea level, in feet

Median—Middle value, half the historical streamflow values are above, half below

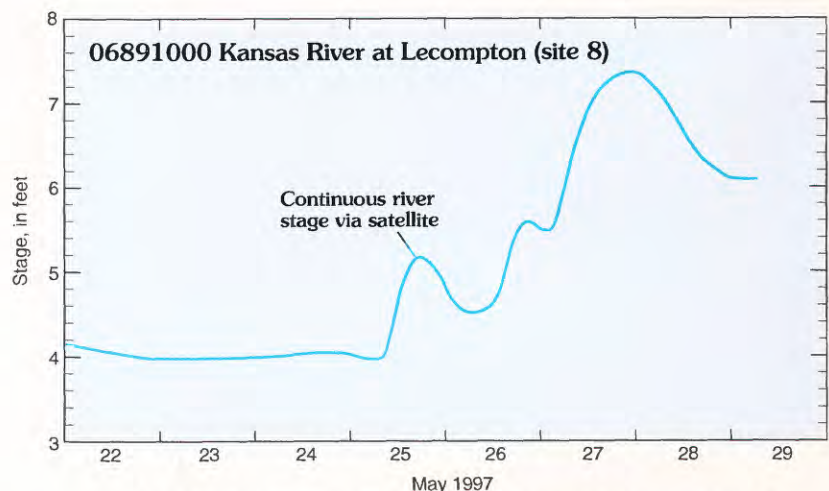
Instruments at the gaging station record continuous river stage. River stage is the height of the water surface above gage datum, a reference elevation. Flood stage is the level where the stream begins to overflow its banks. If the stage of the streambed is known and subtracted from the water-surface stage, then the result is the depth of water in the stream. Monitoring stage changes provides information to river users about river stage due to reservoir releases and significant rainfall.



Typical USGS streamflow-gage house equipment used to transmit data from stream bank to satellite to the USGS office and onto the INTERNET.

Gage height graph

Knowledge of U.S. Geological Survey (USGS) stage-monitoring information like this stage data recorded in May 1997 for the Kansas River at Lecompton can make boating and other recreational activities on the river much safer and more enjoyable. If river stages are at or near flood conditions, the river may be unsafe. In contrast, when the river stages are indicated to be near the streambed, the stream may be too shallow or nearly dry in some places and may not be enjoyable for recreational activities.



INTERNET record of stage data recorded May 1997 for Kansas River at Lecompton.



View of Kansas River near medium stage, looking upstream from the Lecompton bridge.

Streamflow measurements define gage height-discharge relation.

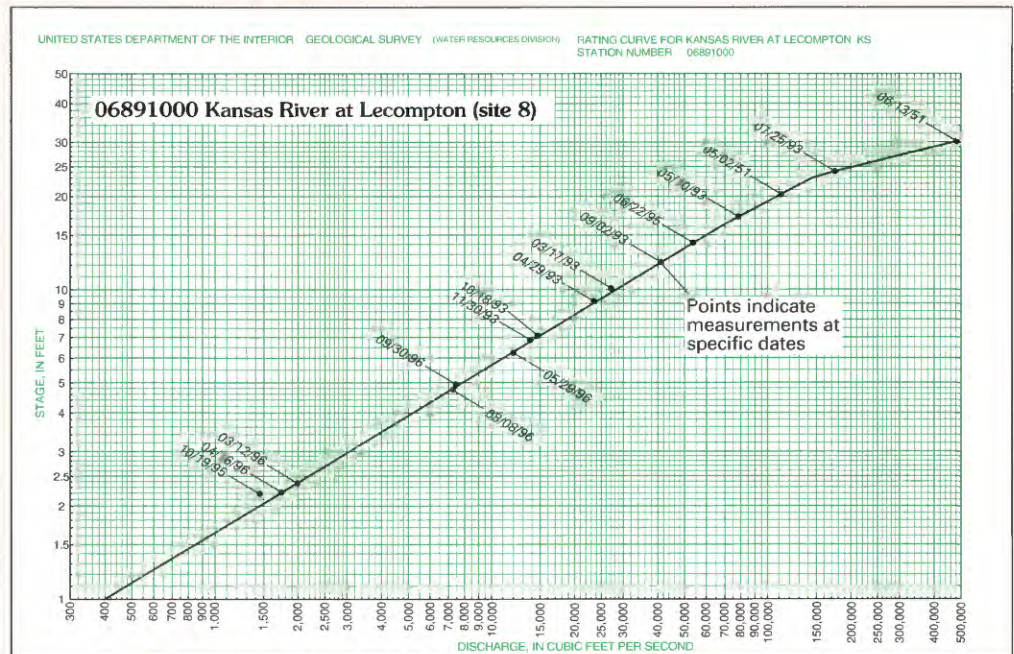
USGS technicians measure discharge or flow at all gaging stations on a routine schedule. Measurements of water depth and velocity are made at approximately 30 locations across the stream. The distance between measurement locations (width), the speed of the water (velocity), and water depth are multiplied to compute discharge (or streamflow) in cubic feet per second (ft^3/s). Many of these measurements made over the range in stage of the stream are plotted against the corresponding stages to define the stage-discharge relation that is used in conjunction with the recorded stage to determine continuous discharge throughout the year.



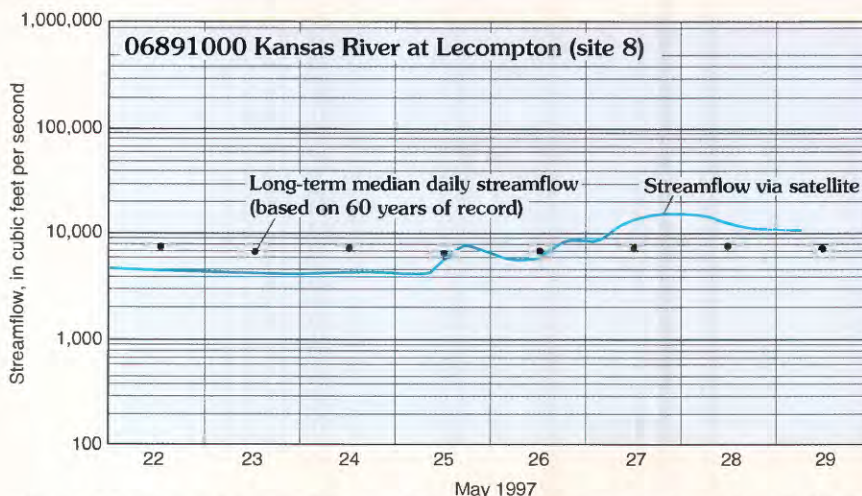
USGS technician measuring discharge on the Kansas River at Lecompton.



Canoeist enjoying the Kansas River at Burcham Park in Lawrence, Kansas.



Stage-discharge relation for Kansas River at Lecompton.



Hydrograph of flow for Kansas River at Lecompton from INTERNET.

Discharge graphs

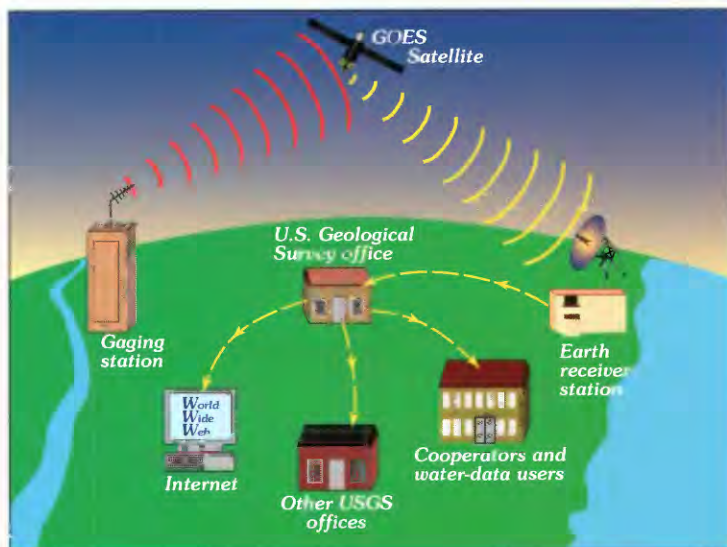
Continuous discharge information at gaging stations, like this "hydrograph" of the flow of the Kansas River at Lecompton, is useful to boaters and other recreational users. Because discharge is related to stream velocity, those experienced with the river can relate discharge information to how fast the water is moving down the stream. For example, veteran boatmen on the Kansas River have been able, through experience, to determine a relationship between the river's discharge and good or poor boating conditions.

USGS provides real-time stream and lake information

Access to USGS real-time water-level information on the INTERNET is made possible by satellite links with USGS offices. Recorded stage data are transmitted around the clock from gaging stations to one of two Geostationary Operations Environmental Satellites (GOES) that are positioned at an altitude of 22,300 miles above the equator. The satellites are operated by the National Oceanic and Atmospheric Administration (NOAA). These water-level data are relayed to ground stations and the signal is transmitted on to the USGS. The stage data are processed with the stored stage-discharge relation to compute continuous streamflow (discharge). This automated telemetry provides water-data users with provisional stage and streamflow information in a timeframe that meets recreational and water management needs.



Near real-time water-level data can be accessed easily though your internet connection.



The technology also permits the USGS field offices to monitor the operation of the hydrological stations continuously, time visits to stations to coincide with times of maximum need for data (such as during floods), and to service equipment at the stations.

Other water resources information such as publications, historical streamflow data, and research in the Kansas District USGS are available at this site.

Many organizations are linked to the USGS and use its data regularly. Streamflow data are important for reservoir operation, flood warning and forecasting, design of bridges and flood-control structures, water-supply development and management, flood-plain regulation and insurance purposes, water-rights administration, as well as recreational activities. Because of its importance, funding for gaging stations operated by the USGS in Kansas is provided by the Kansas Water Office (using State Water Plan funds), the U.S. Army Corps of Engineers, the USGS, and to a limited extent by many other State and local agencies.

—James E. Putnam

Surfin' the Net' for Kansas Stream and Lake Information

Starting address is <http://www-ks.cr.usgs.gov/>

Choose from these options on INTERNET homepage:

1. Current Streamflow Conditions--

Then click on station name to get stage graph page,

Four options are:

- Streamflow hydrograph (discharge Graph)
- Complete station data (previous years daily discharge)
- Historical and peakflow data (annual floods for periods of record)
- Map of area surrounding the gaging station (can zoom in or out)

2. Current Streamflow Conditions Map--

Then click on station location to get stage graph and get options a, b, c, and d above.

3. Lakes and Reservoirs--

Then click on lake or reservoir name for individual lakes (format varies) or Corps of Engineers report for Missouri or Arkansas River Basin Reservoirs



The USGS is a member of the Kaw Valley Heritage Alliance and through this partnership responds to the needs of water-resource interests in the Kansas River Valley. People with recreational interests also can access this data from another Kaw Valley Alliance partner, the Kansas Canoe Association's INTERNET address (<http://www.kansas.net/~tjhittle>) and then link to the USGS.

For additional information contact:

U.S. Geological Survey
4821 Quail Crest Place
Lawrence, Kansas 66049-3839

(785) 842-9909
fax: (785) 832-3500
email info@maildkslwr.cr.usgs.gov